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ABSTRACT

This study, which focused on interactional and contingency aspects of the imitative process, examined the contributions of six normally developing and four moderately retarded children to imitative interactions with their mothers. The subjects were part of a group of 20 mother-child dyads who participated in an 18-month longitudinal study. Children were Caucasian, first or second born, from families of lower middle socioeconomic status, approximately 2 to 3 years of age and of similar language ability. Data on mother-child interactions were collected during home observations lasting 20 minutes. For each dyad, two samples containing at least 50 intelligible utterances were selected from the mean length of utterance (MLU) interval of 1.01 to 1.25. Children's verbal imitations were described in terms of their frequency, content, relative independence from mother behavior, and pragmatic functions. The linguistic and pragmatic characteristics of children's overall speech samples were described. Mother prompts for imitation were described in terms of frequency, content, explicitness, and relation to child's preceding verbal behavior. Mothers' responses to children's imitations were also described. Several linguistic measures were calculated to describe the children's language. These included MLU in morphemes, intelligibility, longest utterance, diversity of imitated utterances, and the number of novel spontaneous words occurring in the first 50 utterances of each sample. The linguistic diversity of mothers' prompts and mothers' MLUs was also calculated. Study results showed that normal children exhibited a slightly more diverse set of imitative responses but no differences in linguistic complexity of imitated speech were observed between the normal and handicapped samples. Generally, the handicapped children were less skilled, and differences between their mothers' behavior and the behavior of mothers of normal children were correlated to their skill level rather than simply to their developmental classification. (RH)

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Imitation in Transactions

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Imitation by Normal and Developmentally Delayed Children in Mother-Child Transactions¹

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During the last 15 years, a considerable number of studies have sought to explore the function of imitation in language learning. These studies have generally been of two types: studies in which the role of imitation was examined by eliciting imitative responses from children and analyzing subsequent learning of the imitated content (Stewart, 1976; Connell, 1982; Corrigan, 1982) and studies describing naturally occurring imitation as observed during interactions between children and adults (c.f. Bloom, Hood & Lightbown, 1974; Stine & Bohannon, 1983).

For the most part, imitation has been examined from a perspective that assumes that imitation is strictly a child-based phenomenon. Imitation in general has been studied as an independent behavior rather than as a part of a behavioral transaction between mother and child. While children's imitations have often been described as selective, little attention has been given to the range of models or the consequences provided by the interacting adults. It is surprising that differences in children's frequency of imitation and selection of forms to imitate have not been examined in terms of the adult's contribution to the interaction given the general acceptance of a model of mutual influence in parent-child linguistic interactions (McDonald & Pien, 1982; Olsen-Fulero, 1982). Even studies reporting individual differences in the frequency of children's

imitations have failed to account for these differences in terms of the interacting adult's contribution to the interactions (c.f. Bloom, Hood & Lightbown, 1974; Ramer, 1976; Folger & Chapman, 1978).

Studies contrasting imitation by normal and atypical children offer a unique context for examining mother and child contributions to patterns of imitation. The few studies comparing naturally occurring patterns of imitation in normal and handicapped children have reported that handicapped children are as imitative as, or more imitative than, normally developing children at similar language levels (Rondal, 1980; Rosenberg, 1982). In other studies, mothers of handicapped children have been described as more directive in interactions with their children and more likely to prompt imitations than mothers of similarly skilled normally developing children (Maurer & Sherrod, 1984; Rondal, 1978). These independent findings suggest that both mother and child behavior may differ when the child is handicapped. Given this apparent difference, a systematic description of mother and child contributions to imitative interactions in dyads with normal and handicapped children may provide some insight into the ways in which partners influence each other's communicative behavior and influence imitation in conversational interactions.

The purpose of the current study was to examine mother and child contributions to imitative interactions in dyads containing normal and developmentally delayed children at a similar linguistic level. In general, we were interested in the interactional and contingency aspects of the imitative process more than we were interested in the strictly linguistic aspects. The coding scheme we selected was one in which mother behavior and child behavior were described pragmatically and in relationship to each other's behaviors. The description had three components. Children's verbal imitations were described in terms of their frequency, their content, their relationship to mother behavior (i.e. their relative independence from mother behavior) and their pragmatic functions. In addition, the linguistic and pragmatic characteristics of the children's overall speech samples were described. Mother prompts for imitation were described in terms of their frequency, content, explicitness, and relationship to the child's preceding verbal behavior. Mother responses to child imitations were also described.

Based on our previous comparative studies of normal and handicapped children interacting with their mothers, (Kaiser & Blair, in press) we anticipated that there would be differences in child behavior even within a small set of linguistically matched subjects and that these differences would be reflected in differences in mother's behavior.

Specifically, our previous studies had shown that handicapped children had smaller spontaneous vocabularies, and that their language was less linguistically diverse, pragmatically more limited, and less spontaneous than normal children's language during early stage I. If mothers were responsive to these differences, we predicted that mothers of handicapped children would provide models that were less diverse and more explicit than those provided by mothers of normally developing children.

Method

Subjects. The subjects for this study were 10 children and their mothers. Four children were identified as moderately retarded; six children were normally developing. Assignment of children to normal and retarded categories was based on (1) comprehensive behavioral assessments administered, and (2) Bayley scores at the beginning of the current study. All subjects were caucasian, first or second born, and their families were lower middle SES. Subjects were part of a group of 20 mother-child dyads who participated in an 18 month longitudinal study. Subjects are described in Table 1. These were the same subjects and samples used in our preceding study and thus, considerable analyses of children's spontaneous speech were already available to us. In addition to the characteristics described in Table 1, it is important to note that:

- 1) Normal children were more verbal than handicapped children
(N=108 H =73 / sample)
- 2) Normal children had larger spontaneous vocabularies than
Handicapped children
(14.25 vs 8.45 novel words/to utterances)
- 3) Normal children's upper bound was significantly longer
than Handicapped children
- 4) The groups did not differ in terms of MLU

One important difference in mother behavior should also be noted: Mothers of normally developing children asked questions significantly more often than they prompted imitation as a means of getting a single word response.

Insert Table 1

Procedures. Data on mother-child interactions were collected during home observations lasting 20 minutes. Mothers were instructed to interact with their children as they might during any time they played with them.

Selection of samples. Samples for the current study were selected from those collected in the longitudinal study. For each dyad, two samples containing at least 50 intelligible utterances were selected from the MLU interval 1.01 - 1.25. This very small interval was chosen so that

normal and handicapped children subjects might be matched as closely as possible.

Coding. Three levels of data coding were completed.

1) Verbatim transcriptions of mother and child verbalizations were prepared from the video tapes. 2) Each utterance was then coded using the pragmatic categories shown in Table 2.

Insert Table 2 here

3) Imitative episodes were selected from the coded transcripts, and mother prompts, child imitations, and mother responses to child imitation within these episodes were coded using the scheme summarized in Table 3. In addition to coded

Insert Table 3 here

categories, several linguistic measures were calculated to describe the children's language. These included: mean length of utterance in morphemes (MLU), intelligibility, upper bound (longest utterance), diversity of imitated utterances, and the number of novel spontaneous words occurring in the first 50 utterances of each sample. The linguistic diversity of mothers' prompts and mothers' MLUs were also calculated.

Reliability. A total of 14 reliability checks were conducted for the 20 samples. Reliability for all categories of mother and child behavior reported in this paper exceeded 80%.

Results

The results are presented in three sections: 1) mothers' prompts for imitations, 2) children's imitations, 3) mothers' responses to child imitations.

Mother prompts. First, mothers of normal and handicapped children gave a similar number of opportunities to imitate when both implicit and explicit opportunities were counted. Mother prompts were coded in terms of their diversity (the number of different utterances that were modeled during a session) and the explicitness of the models provided. Explicit directives were specific mother requests for imitation (e.g. "say, zebra"). Mother statements that labeled objects or attributes of objects in the child's visual field were scored as "Encoding" and were considered as implicit prompts. These statements were typically brief and had the intent of drawing the child's attention to the object and its label. No child response was specifically prompted (and hence, child responses to encoding were scored as spontaneous imitations). The presentation of a discrete label - object pairing was presumed to represent an opportunity for the child to imitate that was different than

the opportunities available in the mother's ongoing flow of speech.

The results in Figure 1 indicate that mothers of handicapped children provided more explicit prompts for

Insert Figure 1 here

imitation than mothers of normally developing children. Thirty-two percent of mother prompts to normal children were explicit prompts for imitation while 66% of mother prompts to handicapped children were explicit ($t(8) = p < .05$). (When % was calculated based on all mother attempts to elicit verbal behavior). The mothers in two groups did not differ significantly in terms of diversity of prompts, although 71% of normal mother prompts were diverse while only 57% of handicapped children mother prompts were.

Child imitations.

Overall, normal and handicapped children differed significantly in the proportion of their total intelligible speech that was imitative. Sixty-five percent of handicapped children's speech was imitative while only 33% of normal children's speech was imitation ($t(8) = 2.498$ $p < .05$).

Insert Figure 2 here

Normal and handicapped children differed in the relative spontaneity of their imitations. Eighty percent of normal children's imitations were spontaneous; 20% were explicitly prompted. For, handicapped children, 47% of imitations were spontaneous, while 53% were explicitly prompted. The differences in spontaneous and prompted imitation across the two groups of children were significant ($t(8) = 2.68$ $p < .05$; $t(8) = 2.69$ $p < .05$).

Normal children averaged three times as many spontaneous imitations as they did prompted imitations (MN=24.58 spontaneous; MN=8.75 explicitly prompted). Handicapped children had nearly equal numbers of spontaneous and prompted imitations (MN= 22.13 spontaneous; 24.75 prompted).

Handicapped children were more likely to imitate mother utterances exactly than were normal children as shown by the proportions of iconic (exact) and partial imitations in Figure 4. Almost all handicapped children's imitations were immediate (89%) whereas, normal children were evidencing more delayed imitation (23% vs 11%).

Although handicapped children averaged a greater number of imitations than the normal children (46.9 vs 33.3 imitations per 20 minute session), the difference was not

statistically significant. Handicapped children were somewhat more responsive to mother explicit prompts than the normal children (48% responsiveness for handicapped; 36% for normal subjects), but again the difference was not significant. Normal and handicapped children were equally responsive to implicit prompts for imitation. Figure 4 shows the children's pragmatic use of imitated utterances.

Insert Figure 4 here

Normal children showed somewhat greater diversity in their pragmatic use of imitation. While the majority of handicapped children's imitations were coded only as answers, (responses to mother prompts) normal children showed a somewhat more balanced pattern. Sixty-seven percent of normal children's imitations had an identifiable pragmatic function other than just responding; 42% of handicapped children's imitations had an identifiable function. Small percentages of normal children's imitations were coded as request/commands and questions seeking clarifications, suggesting that a broader range of pragmatic functions was beginning to appear for the normal children.

Mother responses to imitations. Mothers of normal and handicapped children responded very similarly to their

children's imitations as shown in Figure 5. Mothers in both groups responded to about 89% of their children's imitations.

Insert Figure 5 here

Mother responses continued the child's topic during more than 75% of the imitative episode for the two groups.

Approximately 13% of mother responses were expansions, an average of 25% were repetitions, and more than 63% were other comments.

Discussion

Although normal and handicapped children imitate with similar frequencies, their imitations differ in several ways, suggesting that imitation may function differently for them. First, imitations make up a significantly larger proportion of handicapped children's total verbalizations. Handicapped children appear to rely more on imitation in conversations with their mothers. Second, normal children imitate more spontaneously than handicapped children. Normal children appear to be more proactive in their use of imitation. That is, they select forms to imitate from the on going conversational input of their mothers. Normal children most often imitate at their own choosing as indicated by the proportion of their imitations that are responses to implicit prompts. Handicapped children most frequently imitate when

specifically directed to do so. Third, normal children concurrently express a slightly greater range of pragmatic functions via imitation than do handicapped children; further suggesting that they use the imitative response in a slightly different way. Normal children occasionally used imitative forms to ask questions, to seek clarifications and to make requests while almost all of the handicapped children's imitations functioned as answers or acknowledgements.

In general, children's use of imitation followed the same pattern discernable in their overall speech samples. Our previous study with the same sample of children had shown normal children had larger vocabularies than handicapped children, their upperbounds were slightly longer, and they spoke more frequently and more intelligibly. They displayed slightly greater flexibility in their pragmatic use of language, showing a somewhat more evenly distributed pattern of usage across functional categories (Kaiser and Blair, in press). In the current study, normal children exhibited a slightly more diverse set of imitative responses but no differences in linguistic complexity of imitated speech were observed between the normal and handicapped samples. The present study suggests directions for exploring the transactional influences of mothers and children in the imitative process. Differences in mother choice of modeling tactic (implicit versus explicit) may be a response to

characteristics of the child's language (vocabulary size). Mothers appear to become less directive in soliciting imitation and provide a greater range of models as the child's linguistic skills increase. Longitudinal analyses of changes in mother prompts and child responses are need to fully explore these mutual influences.

Although the current study involved contrast groups of normal and handicapped children and their mothers, the sample size and the level of individual variability within groups limits the generalizations that can be made to either population. The present data are best viewed in terms of representing 10 children with a range of language skills within early Stage I language development. Generally, the handicapped children were less skilled, and differences between their mothers' behavior and the behavior of mothers of normal children were correlated to their skill level rather than simply to their developmental classification. Mothers in the two groups showed generally similar patterns of prompting and consequating imitations with the exceptions in explicitness and diversity noted above. These results suggest that it is the complexity of the child's linguistic behavior that keys the pattern of interaction and of imitative prompting and responding that is observed within dyads. In this light, mother behaviors appear logically related to their children's skills and although mothers of

handicapped children (who in this sample were generally less skilled than the normal group) provided a more directive interaction style, this difference should not necessarily be considered as a deficit in mother strategy or a less desirable interaction pattern.

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Table 1

Subject Characteristics

A	Retarded	Sex	CHILD AGE		CHILD MLU		UPPERBOUND		Child Utterances averaged across two samples	Intelligible Utterances averaged across two samples	Mother MLU		Mother Utterances averaged across two samples
			Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2			Sample 1	Sample 2	
S#	5	F	2.11	3.1	1.05	1.05	2	2	116.5	64	2.72	2.23	189.5
	19	F	2.8	2.5	1.04	1.11	3	3	119.5	51.5	2.68	2.83	347.5
	6	F	3.3	3.4	1.01	1.01	2	2	219	90.5	3.04	3.10	419.5
	2	M	2.9	3.2	1.10	1.12	2	3	147	87.5	2.83	2.80	367
Mean			2.11				2.37		150.5	73.4			330.9
B	Normal												
S#	10	F	2.0	2.3	1.22	1.07	3	3	205	77	2.69	2.66	372
	4	M	2.1	2.5	1.06	1.18	4	3	188.5	90.5	2.91	2.84	231
	1	M	1.10	1.11	1.05	1.18	3	4	278	173.5	3.36	2.98	299
	14	F	1.9	1.11	1.02	1.09	2	4	226.5	132	3.41	3.65	414
	15	F	2.3	2.4	1.08	1.14	2	5	124	78	3.58	3.89	243
	8	M	1.8	1.11	1.17	1.1	3	3	205	95.5	3.2	2.76	402
Mean			2.0				3.25		204.5	107.7			326.8

Table II

Summary of Mother-Child Code Categories

<u>MOTHER BEHAVIORS</u>		<u>CHILD BEHAVIORS</u>
<u>Elicits verbal behavior</u>		<u>Nonverbal Behaviors</u>
SF	Elicits a specific form	C Compliance
SFM	Elicits a specific form with model	NC Noncompliance
IO-Q	Information/opinion seeking - question	OC Compliance unknown
CE	Elicits a clarification or elaboration	
<u>Elicits acknowledgement</u>		<u>Vocalizations</u>
RTY	Receptive testing - yes/no	VO Vocal Behavior unintelligible
IQ-Y	Information/opinion seeking	
ENQ	Encoding as question	<u>Verbal Behavior</u>
RQ	Response question	ANS Answer
AIQ	Adds information as question	NVA Nonverbal answer
<u>Elicits Nonverbal Behavior</u>		CT Comment
I	Instruction	Q Question
RTNV	Receptive testing - nonverbal	QCL Clarification question
<u>Feedback for verbal behaviors</u>		RC Request/command
PFV	Positive feedback (praise) for verbalization	VOC Vocative
CFV	Corrective feedback for verbalization	AV Acknowledges verbalization
IV+	Acknowledgement of verbalization - positively-stated	ANV Acknowledges nonverbal behavior
IV-	Acknowledgement of verbalization - negatively-stated	PRO Protest
<u>Feedback for nonverbal behaviors</u>		OTH Other
PFNV	Positive feedback (praise) for nonverbal behavior	
ANV+	Acknowledgement of nonverbal behavior - positively-stated	
ANV-	Acknowledgement of nonverbal behavior - negatively-stated	
<u>Comments</u>		
4.	Encoding	
	Adds information	

Table III

Imitation Code

Mother Prompts

Type of Prompt
 explicit
 implicit
 Pragmatic Function
 see pragmatic code
 Relationship to
 Previous Child
 Utterance
 no repetition
 repetition
 repetition &
 expansion

Child Responses

Type of Response
 prompted imitation
 spontaneous imitation
 no imitation
 no response
 Pragmatic Function of
 Imitation
 see pragmatic code
 Type of Imitation
 immediate
 delayed
 Form of Imitation
 partial
 iconic
 expanded

Mother Responses

Form of Response
 repetition
 expansion
 no repetition
 Pragmatic Function
 see pragmatic code
 Conversational
 Function
 continuous
 discontinuous

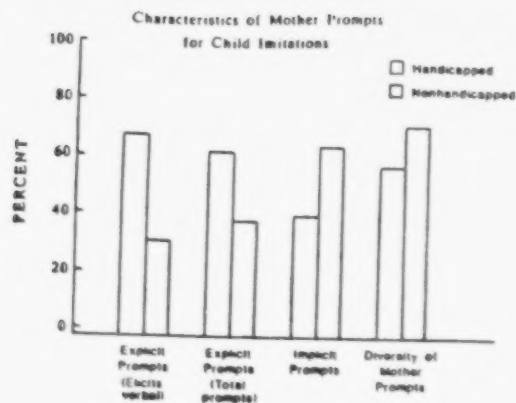


Figure 1



Figure 1

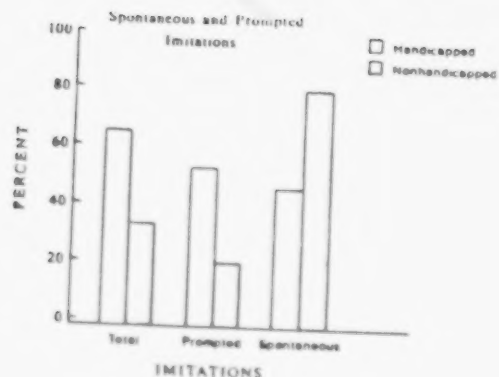


Figure 2

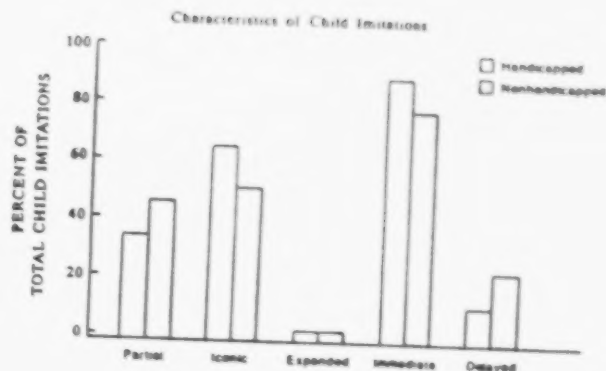


Figure 4

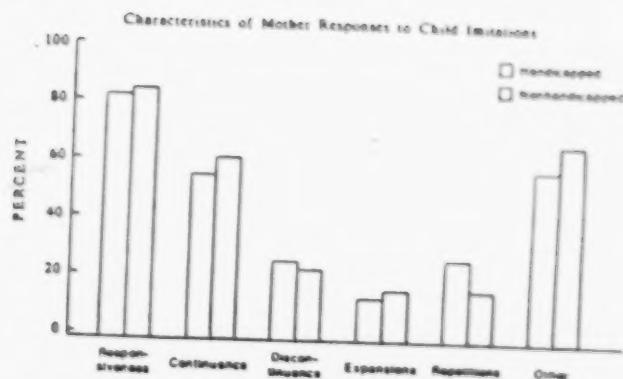


Figure 3

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